From: Lake, Paul
To: Kolak, Shari
Subject: FW: Draft Tech Memo Comments for LCCS
Date: Monday, November 27, 2017 11 24.45 AM

Hi Shari,

Just following up on the comments below. Were you going to send comments on the Tech Memo to ARCADIS/the LCCS Group?

Paul.

From: Lake, Paul
Sent: Thursday, October 19, 2017 9:32 AM
To: Shari Kolak <kolak.shari@epa gov>
Subject: Draft Tech Memo Comments for LCCS

Shari,

Here are the comments I spoke about during our meeting yesterday Feel free to bounce them off of your risk assessor Note, it is recommended to collect at least another round of samples from the IRM, just as Leo was suggesting they could do I don't think there's is anything in here to prevent them from being sent to ARCADIS/the LCCS Group

Section 5.1; Nature and Extent of Constituents in Groundwater: On page 16 it states that "The results from all four quarters of data were very similar and the fourth monitoring event was chosen as a representative data set." All the groundwater data from all four quarters should be used and screened against appropriate benchmarks. ARCADIS never discusses why they believe the fourth quarter is "representative." In addition, MW12 was only sampled for one quarter (this is the well with the LNAPL). It should be noted that the contaminant concentrations of contaminants were very high in MW12

Section 6; Preliminary Evaluation of Recent LCCS and Historical IRM Data: As part of the OU2 RI/FS work plan, an approach for conducting the baseline human health and ecological risk assessments was outlined. ARCADIS states in Section 6 of the technical memorandum that the preliminary evaluation contained within the tech memo "is not designed to replace either of those two assessments nor is it designed to replace any particular section of those assessments (such as the selection of constituents of concern (COCs))." ARCADIS goes on to state that the preliminary screening conducted as part of the technical memorandum was to show "likely findings of the BHHRA and BERA" and to "inform and expedite the process of completing the RI phase of the work."

Essentially, ARCADIS conducted a major short cut of the risk assessment process. Although screening tables were included in the tech memo showing a comparison to the human health and ecological screening criteria listed in the RI/FS WP, ARCADIS concluded that the only benchmarks applicable to human health are those based upon a recreational receptor. This is in opposition to their response to USEPA on the RI/FS Work Plan which stated that "*Future construction workers and park employees at Indian Ridge Marsh will be evaluated as*

potential receptors in the BHHRA " Even though ARCADIS indicated that future construction workers and park employees at IRM would be evaluated as potential receptors, the only receptor evaluated with alternative IRM-specific benchmarks was the recreational receptor.

ARCADIS further concludes that the LCCS is **not** a principal source of constituents to IRM and they further state that the human health and ecological screening results support their conclusion that no further evaluation of risk is needed. Illinois EPA doesn't agree that ARCADIS has made a compelling case for this conclusion. The following bullets identify issues of concern:

- The screening was conducted using only five monitoring wells (MW-04 through MW-08). This doesn't consider the potential migration of contaminants detected in other wells into the IRM. The screening process should include screening data from all the monitoring wells sampled.
- Along with the maximum concentrations, ARCADIS used the arithmetic average to compare to the benchmarks (both human health and ecological benchmarks). The maximum concentration is typically used in the screening evaluation and the 95% UCLs (if sufficient data are available for calculating the 95% UCL) are to be calculated as the exposure point concentrations for receptors (except construction worker and immobile ecological receptors) in the human health and ecological risk assessment.
- ARCADIS states on page 22 that human health-based standards from 35 IAC 302.208 and 302.407 "include exposure through consumption of surface water as a drinking water supply." Per communication with Illinois EPA's Bureau of Water, this statement is incorrect. The human health-based standards from those sections are based upon either incidental ingestion intake rates or the assumption of no water intake. Therefore, the standards from 35 IAC 208 and 302.407 are applicable and should be used in the screening process.
- ARCADIS claims the water within the fill material at LCCS does not meet the definition of groundwater under 35 IAC Part 620 and, therefore, objectives and standards from 35 IAC Part 742 and 35 IAC Part 620 do not apply. This may be a true statement which needs to be verified.
- ARCADIS further states that, although the surface water standards in 35 IAC 302.210 are based upon a recreational contact scenario, the ingestion rate for fish used in the development of the standards is not realistic for the IRM. That type of site-specific evaluation should be conducted as part of the Baseline Human Health Risk Assessment process, not as part of an initial screening evaluation. Additional resources can be consulted for fish consumption rates such as the Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010), April 2014, EPA-820-R-14-002 and the USEPAExposure Factors Handbook, September 2011, EPA/600/R-090/052F.
- On page 24 (and again in the ecological screening), ARCADIS conducted a "rough estimate of mixing" which is definitely "rough" and is not technically supportable. The dilution estimate was determined based upon averaging two surface sample results (SW-05 and SW-06) from 2009 and comparing them to the average of the groundwater results from four monitoring wells (MW-4, MW-5, MW-6, and MW-7) from 2016 and 2017...several years apart! It is suggested references to this rough "10X" dilution be deleted from the document.
- There doesn't appear to be any discussion of potential bioaccumulative contaminants. Of course, that type of discussion is typically left to the BERA. Bioaccumulative contaminants are not to be screened out during the initial screening assessment.
- ARCADIS needs to make sure that the duplicate data are handled as follows:
    - If a constituent was detected in both samples and the relative percent difference

(RPD) is less than 25%, the average of the two samples will be used.
    - If a constituent was detected in both samples but the RPD is greater than 25%, the maximum concentration will be used.
    - If a constituent is detected in only one sample, the detected concentration will be used.
- I don't know what to make of the spatial comparisons in Section 6.2. ARCADIS is using one surface water sampling round (metals and ammonia-nitrogen only) from April 2009 to support their conclusion that LCCS is not a principal source of constituents to IRM (page 28). ARCADIS further states that the results from only two sediment samples further support their conclusion. ARCADIS even concludes on the bottom of Page 28 that "To the extent that the human health and ecological screening evaluations presented elsewhere in this Technical Memorandum suggest that additional investigation and evaluation of select constituents in IRM may be necessary, the spatial evaluation of existing data presented herein suggests that such investigation and evaluation should focus on other portions of IRM and sources of constituents to those portions of the IRM." Again, the conclusion is unsupportable based upon one round of surface water data and two sediment samples.
- Section 6.3: Comparison of IRM Surface Water Data to Human Health and Ecological Benchmarks: In Section 6.3, ARCADIS uses the 2009 surface water data and compares it to the IRM-specific benchmarks for the recreational receptor. The 2009 surface water sample results only included 17 metals and total ammonia-nitrogen. However, on Page 24 it states that six constituents (arsenic, manganese, Aroclor-1221, Aroclor-1232, ethyl benzene, and vinyl chloride) in groundwater exceeded their IRM-specific benchmark for the recreational receptor. Of those six constituents, only arsenic and manganese were sampled in the surface water samples from 2009 so a data gap exists.

Additional Comment/Concern: There were some elevated detections of manganese in surface water and sediments. That said, the 2009 Tetra Tech sediment data table contained in the appendices of the OU-2 RI Work Plan doesn't even list manganese. Was it sampled in the sediment in 2009? It is hard to believe there weren't any detections if it was sampled. In addition, there is a lot of emphasis placed on the results of the SEM/AVS results but manganese is not one of the metals evaluated for availability through that method.

Let me know what you think,
Paul.